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Coordinated Population Forecast for Sherman County, its Urban Growth Boundaries (UGB), and Area Outside UGBs 2016-2066

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Coordinated Population Forecast

2016

Through

2066

Sherman County

Urban Growth Boundaries (UGB) & Area Outside UGBs

Population Research Center
PORTLAND STATE UNIVERSITY

Photo Credit: Lupine wildflowers along Monkland Lane. (Photo No. sheDB0237)
Gary Halvorson, Oregon State Archives
http://arcweb.sos.state.or.us/pages/records/local/county/scenic/sherman/95.html

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Prepared by

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How to Read this Report

This report should be read with reference to the documents listed below—downloadable on the Forecast Program website (http://www.pdx.edu/prc/opfp).

Specifically, the reader should refer to the following documents:

- *Methods and Data for Developing Coordinated Population Forecasts*—Provides a detailed description and discussion of the methods employed to prepare the forecasts. This document also describes the data sets and assumptions that feed into these methods and determine the forecast output.
- *Forecast Tables*—Provides complete tables of population forecast numbers by county and all sub-areas within each county for each five-year interval of the forecast period (i.e., 2016-2066).

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Executive Summary

Historical

Sherman County's total population has declined since 2000, at an average annual rate of nearly one percent between 2000 and 2010 (Figure 1); however, Wasco UGB, one of its sub-areas, experienced population growth during the 2000s. Wasco, the most populous UGB, posted an average annual growth rate of a little less than one percent during the 2000 to 2010 period. This translated into a population increase of about 30 persons.

Sherman County's population decline in the 2000s was the direct result of consistent net out-migration and periods of natural decreases (more deaths than births, Figure 12). The county's aging population has contributed to an increase in deaths, which combined with a relatively steady number of births has resulted in a natural decrease for nine out of the 15 years between 2000 and 2015. While net out-migration and natural decrease were common during the last decade, in more recent years (2010 to 2015) net in-migration has occurred, bringing with it some population growth.

Forecast

Total population in Sherman County is forecast to increase in the near-term (2016 to 2035), a trend that is driven by growth in the two sub-areas of Rufus and Wasco (Figure 1); however population decline is expected for the county over the remaining 31 years of the forecast period. This population decrease is the result of a growing natural decrease, which is expected to exceed net in-migration around 2030.

Sherman County's total population is forecast to increase by about 50 persons over the next 19 years (2016-2035), but will likely see population decline of more than 80 persons during the last 31 years of the forecast period (2035-2066). Sub-areas are expected to generally follow their historical patterns of population increase or decrease over the forecast period.

Figure 1. Sherman County and Sub-Areas—Historical and Forecast Populations, and Average Annual Growth Rates (AAGR)

	Historical			Forecast				
	2000	2010	AAGR (2000-2010)	2016	2035	2066	AAGR (2016-2035)	AAGR (2035-2066)
Sherman County	*1,934*	*1,765*	*-0.9%*	*1,795*	*1,842*	*1,761*	*0.1%*	*-0.1%*
Grass Valley UGB	171	164	-0.4%	164	163	163	0.0%	0.0%
Moro UGB	337	324	-0.4%	324	316	293	-0.1%	-0.2%
Rufus UGB	268	249	-0.7%	281	320	316	0.7%	0.0%
Wasco UGB	381	410	0.7%	422	437	451	0.2%	0.1%
Outside UGBs	777	618	-2.3%	604	605	539	0.0%	-0.4%

Sources: U.S. Census Bureau, 2000 and 2010 Censuses; Forecast by Population Research Center (PRC).

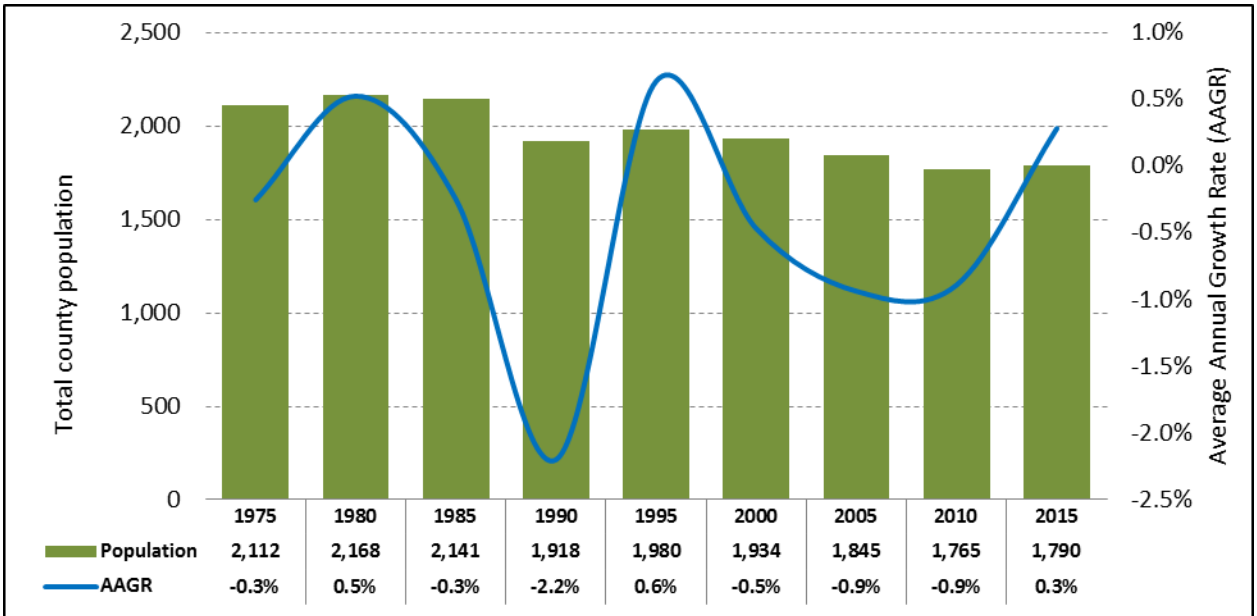
Historical Trends

Sherman County and each of Sherman County's sub-areas were examined for any significant demographic characteristics or changes in population or housing growth that might influence their individual forecasts. Factors that were analyzed include age composition of the population, ethnicity and race, births, deaths, migration, and number or growth rate of *housing units* as well as the *occupancy rate* and *persons per household (PPH)*. It should be noted that population trends of individual sub-areas can differ from those of the county as a whole. However, in general, local trends within sub-areas collectively influence population growth rates for the county.

Population

Sherman County's total population declined by about 15 percent between 1975 and 2015—from roughly 2,100 in 1975 to about 1,800 in 2015 (Figure 2). During this 40-year period there were alternating periods of population increase and decrease, with total population peaking in 1980 at about 2,200 persons. The periods of population decline have generally been longer in duration than those of population increase, a pattern which led the population to decline to 1,765 by 2010. In recent years, population increase returned, leading total population to rise to nearly 1,800 between 2010 and 2015.

Figure 2. Sherman County—Total Population (1975-2015)



	1975	1980	1985	1990	1995	2000	2005	2010	2015
Population	2,112	2,168	2,141	1,918	1,980	1,934	1,845	1,765	1,790
AAGR	-0.3%	0.5%	-0.3%	-2.2%	0.6%	-0.5%	-0.9%	-0.9%	0.3%

Sources: U.S. Census Bureau, 1980, 1990, 2000, and 2010 Censuses; Population Research Center (PRC), July 1st Annual Estimates 1975, 1985, 1995, 2005, and 2015.

Sherman County's population change is the combined population growth or decline within each sub-area. During the 2000s, Sherman County's average annual population growth rate stood at about negative one percent (Figure 3). Only one sub-area, Wasco UGB, recorded a population increase between 2000 and 2010. The remaining sub-areas posted average annual decreases of one-half percent or more, with the area outside UGBs recording the largest annual average decrease of more than two percent.

Figure 3. Sherman County and Sub-areas—Total Population and Average Annual Growth Rate (AAGR) (2000 and 2010)

	2000	2010	AAGR (2000-2010)	Share of County 2000	Share of County 2010
Sherman County	*1,934*	*1,765*	*-0.9%*	*100.0%*	*100.0%*
Grass Valley	171	164	-0.4%	8.8%	9.3%
Moro	337	324	-0.4%	17.4%	18.4%
Rufus	268	249	-0.7%	13.9%	14.1%
Wasco	381	410	0.7%	19.7%	23.2%
Outside UGBs	777	618	-2.3%	40.2%	35.0%

Sources: U.S. Census Bureau, 2000 and 2010 Censuses.

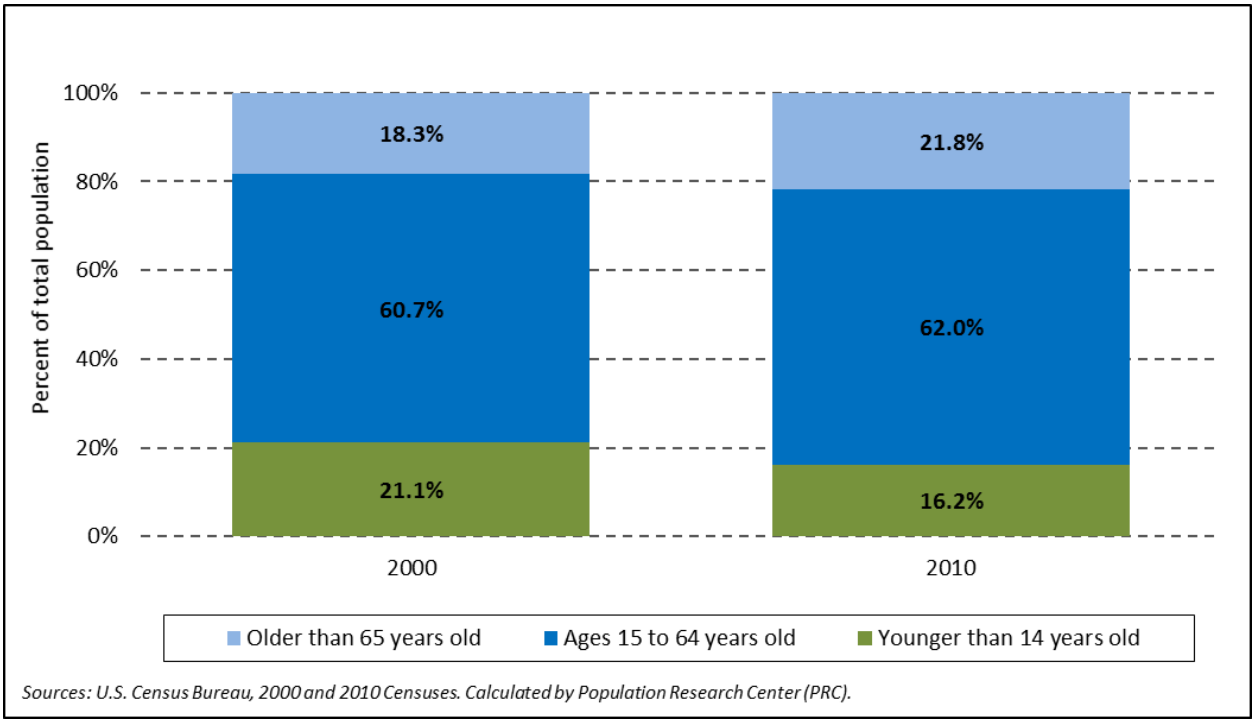
Note 1: For simplicity each UGB is referred to by its primary city's name.

Age Structure of the Population

Sherman County's population is aging, a trend observed in most areas across Oregon and the nation. An aging population significantly influences the number of deaths, but also yields a smaller proportion of women in their childbearing years, which may result in a decline in births. For Sherman County this appears to be true, although calculated fertility rates are quite variable due to the small number of women in reproductive years. Even so births did decrease, but only slightly, while the proportion of county population 65 or older increased between 2000 and 2010 (Figure 4). Further underscoring Sherman County's trends in aging, the median age rose from about 42 in 2000 to 48 in 2010, an increase that is more than double the increase observed statewide over the same time period.[1]

[1] Median age is sourced from the U.S. Census Bureau's 2000 and 2010 Censuses, DP-1.

Figure 4. Sherman County—Age Structure of the Population (2000 and 2010)



Sources: U.S. Census Bureau, 2000 and 2010 Censuses. Calculated by Population Research Center (PRC).

Race and Ethnicity

While the statewide population is aging, another demographic shift is occurring across Oregon—minority populations are growing as a share of total population. A growing minority population affects both the number of births and average household size[2]. The Hispanic population within Sherman County increased slightly from 2000 to 2010 (Figure 5), while the White, non-Hispanic population decreased over the same time period. The increase in the Hispanic population and some other minority populations is notable, but overall the minority population has remained a relatively small proportion of total population and will likely not substantively influence future population change.

[2] Historical data shows that some racial/ethnic groups, such as Hispanics, generally have higher fertility rates than other groups (http://www.pewsocialtrends.org/2012/05/17/explaining-why-minority-births-now-outnumber-white-births/); also average household sizes can vary among racial/ethnic groups (https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&sqi=2&ved=0ahUKEwjp09-PltXMAhUC_WMKHQFZCBEQFggcMAA&url=http%3A%2F%2Fwww.census.gov%2Fpopulation%2Fsocdemo%2Fhh-fam%2Fcps2011%2FtabAVG1.xls&usg=AFQjCNFfO2dYB_OKGxp-ag3hBMVDx4_j9w&cad=rja).

Figure 5. Sherman County—Hispanic or Latino and Race (2000 and 2010)

Hispanic or Latino and Race	2000		2010		Absolute Change	Relative Change
Total population	*1,934*	*100.0%*	*1,765*	*100.0%*	*-169*	-8.7%
Hispanic or Latino	94	4.9%	98	5.6%	4	4.3%
Not Hispanic or Latino	1,840	95.1%	1,667	94.4%	-173	-9.4%
White alone	1,782	92.1%	1,616	91.6%	-166	-9.3%
Black or African American alone	0	0.0%	2	0.1%	2	0.0%
American Indian and Alaska Native alone	27	1.4%	21	1.2%	-6	-22.2%
Asian alone	8	0.4%	3	0.2%	-5	-62.5%
Native Hawaiian and Other Pacific Islander alone	0	0.0%	1	0.1%	1	0.0%
Some Other Race alone	0	0.0%	6	0.3%	6	0.0%
Two or More Races	23	1.2%	18	1.0%	-5	-21.7%

Sources: U.S. Census Bureau, 2000 and 2010 Censuses.

Births

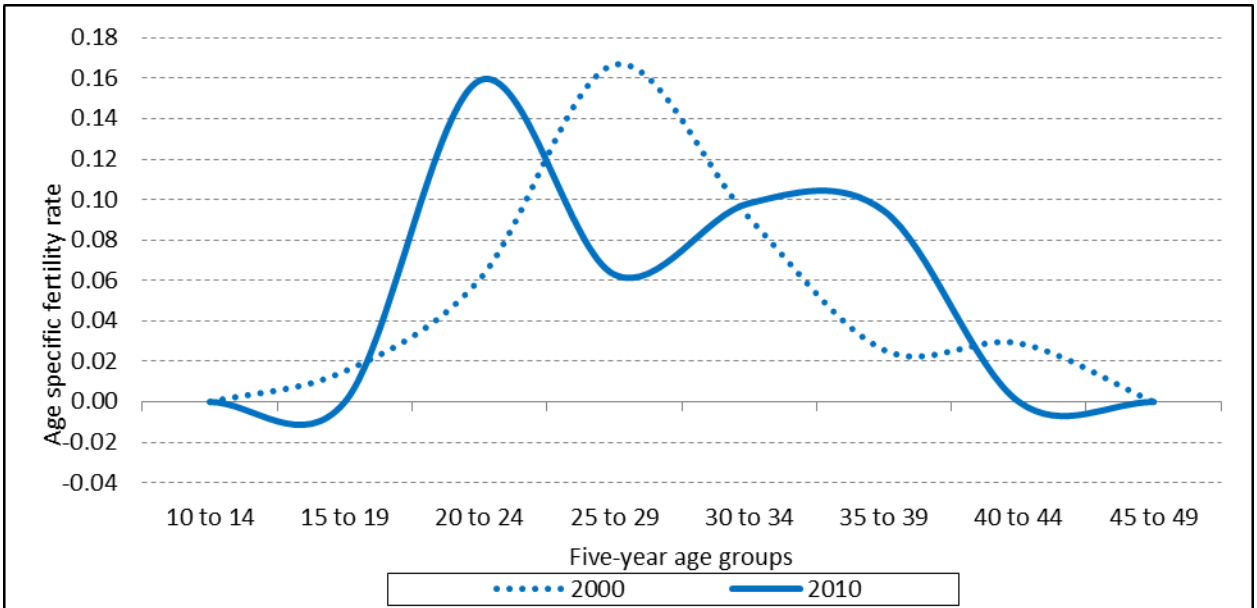
Historical fertility rates for Sherman County do not mirror trends similar to Oregon as a whole. Total fertility rates increased in Sherman County from 2000 to 2010, while they decreased for the state over the same time period (Figure 6). At the same time fertility for older women increased in both Sherman County and Oregon (Figure 7 and 8), but fertility rates for younger women in Sherman County also increased in 2010 compared to earlier decades. Finally total fertility in the county edged up near *replacement fertility*, while for Oregon as a whole, total fertility continues to fall further below replacement fertility. It should be noted that due to Sherman County's relatively small population size, a small change in the number of births may cause dramatic changes in both age-specific as well as total fertility rates.

Figure 6. Sherman County and Oregon—Total Fertility Rates (2000 and 2010)

	2000	2010
Sherman County	1.94	2.07
Oregon	1.98	1.80

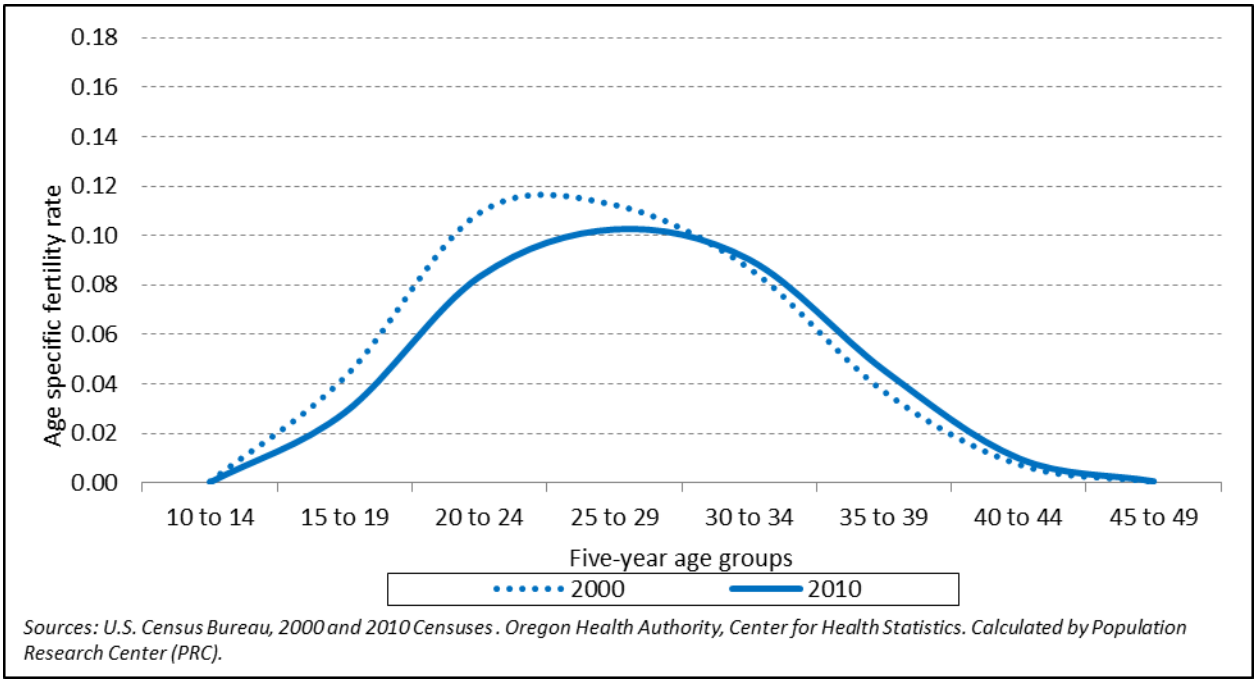
Sources: U.S. Census Bureau, 2000 and 2010 Censuses .
Oregon Health Authority, Center for Health Statistics.
Calculated by Population Research Center (PRC).

Figure 7. Sherman County—Age Specific Fertility Rate (2000 and 2010)



Sources: U.S. Census Bureau, 2000 and 2010 Censuses . Oregon Health Authority, Center for Health Statistics. Calculated by Population Research Center (PRC).

8. Oregon—Age Specific Fertility Rate (2000 and 2010)



Sources: U.S. Census Bureau, 2000 and 2010 Censuses . Oregon Health Authority, Center for Health Statistics. Calculated by Population Research Center (PRC).

Figure 9 shows the number of births by the area in which the mother resides, in this case Sherman County. Generally the number of births fluctuates from year to year. For example, an increase in births between two years could easily show a decrease for a different time period, this is especially true for

areas with small populations. That being said Sherman County saw a decrease in births by 1 between 2000 and 2010 (Figure 9).

Figure 9. Sherman County—Total Births (2000 and 2010)

	2000	2010	Absolute Change	Relative Change
Sherman County	*17*	*16*	*-1*	*-5.9%*

Sources: Oregon Health Authority, Center for Health Statistics. Aggregated by Population Research Center (PRC).

Deaths

The population in Sherman County is aging and people are living longer. For Sherman County in 2000, life expectancy for males was 76 years and for females was 81 years. By 2010, life expectancy had risen to 79 years for males and 88 years for females. For both Sherman County and Oregon, the survival rates changed little between 2000 and 2010—underscoring the fact that mortality is the most stable component of population change. The total number of deaths decreased only by 1 between 2000 and 2010 in Sherman County (Figure 10). Please note that the numbers of births and deaths in both 2000 and 2010 were coincidentally the same in Sherman County.

Figure 10. Sherman County—Total Deaths (2000 and 2010)

	2000	2010	Absolute Change	Relative Change
Sherman County	*17*	*16*	*-1*	*-5.9%*

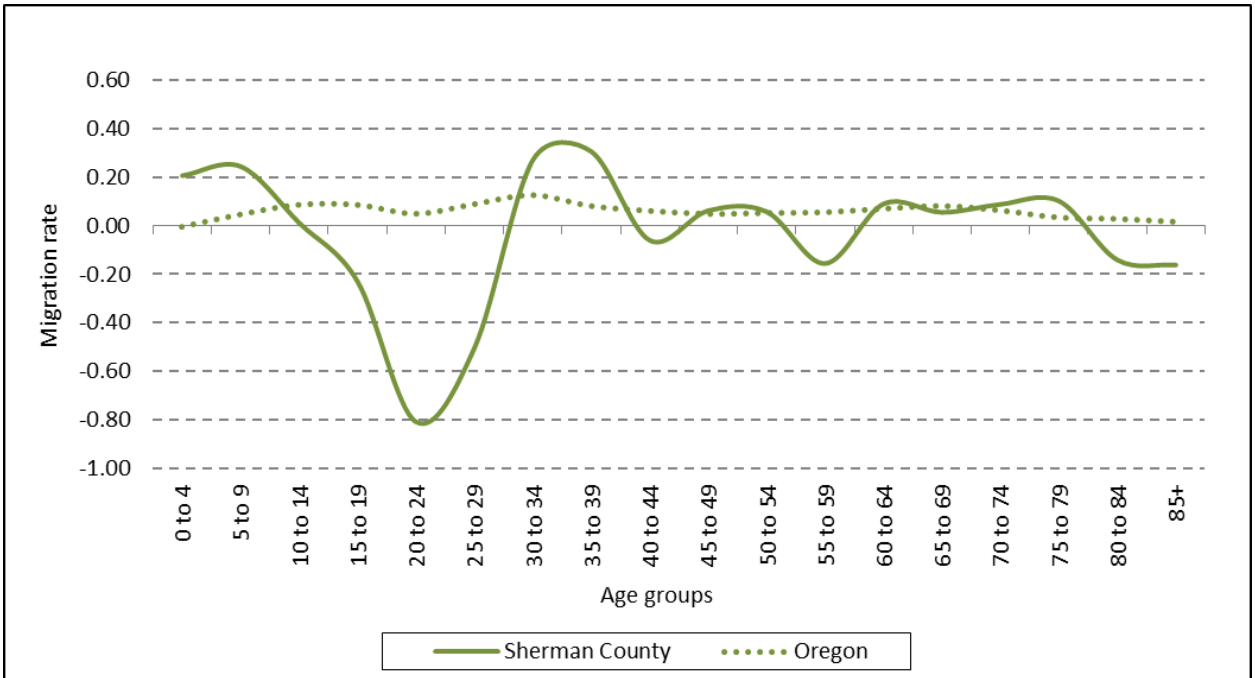
Sources: Oregon Health Authority, Center for Health Statistics. Aggregated by Population Research Center (PRC).

Migration

The propensity to migrate is strongly linked to age and stage of life. As such, age-specific migration rates are critically important for assessing these patterns across five-year age cohorts. Figure 11 shows the historical age-specific migration rates by five-year age group, both for Sherman County and Oregon. The migration rate is shown as the number of net migrants per person by age group.

From 2000 to 2010, younger individuals (ages with the highest mobility levels) moved out of the county in search of employment and education opportunities, as well as military service. At the same time however, the county attracted a substantial number of middle aged migrants. These migrants may have been persons with family ties to the county, returning after leaving at a younger age for education or economic reasons. Many in this group of migrants were assumed to be accompanied by their children as shown in the in-migration of persons under the age of 14.

Figure 11. Sherman County and Oregon—Age Specific Migration Rates (2000-2010)

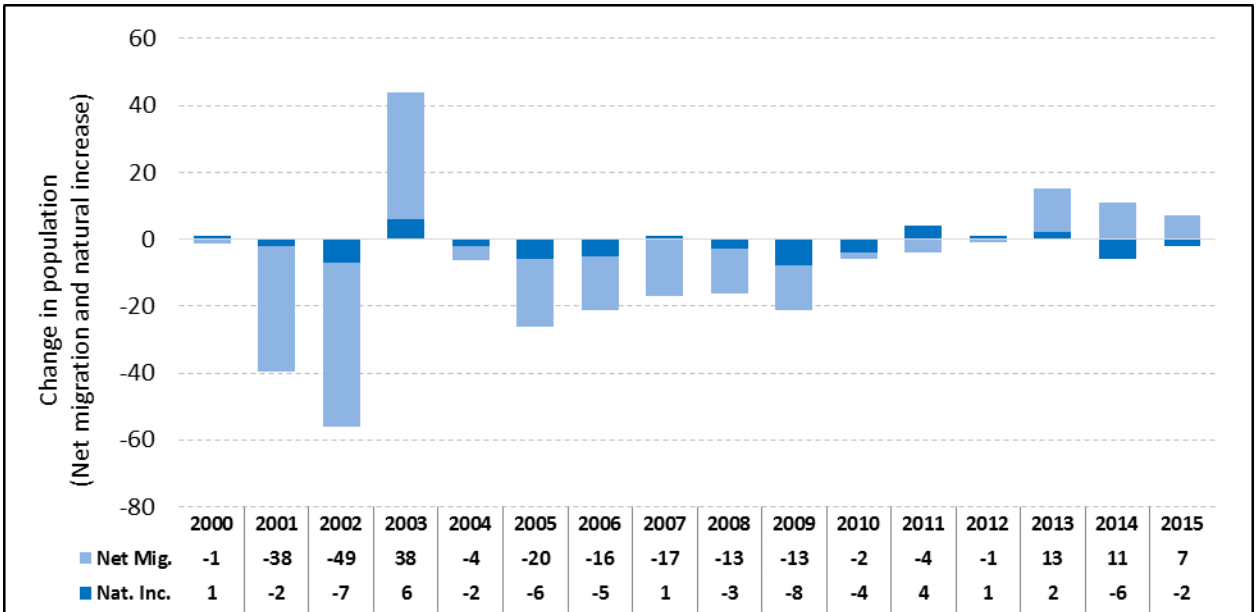


Sources: U.S. Census Bureau, 2000 and 2010 Censuses. Calculated by Population Research Center (PRC).

Historical Trends in Components of Population Change

In summary, Sherman County's population decline in the 2000s was the result of a relatively consistent natural decrease and a net out-migration (Figure 12). On average there were a larger number of deaths than births per year, leading to a natural decrease (more deaths than births) in seven out of the ten years in the last decade (2000-2010). While net out-migration was the norm during most of the last decade, this has shifted toward net in-migration in recent years. The county recorded a natural increase between 2011 and 2013, but has since seen a natural decrease. For the time period since 2010, net in-migration accounts for all of the population increase.

Figure 12. Sherman County—Components of Population Change (2000-2015)



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Net Mig.	-1	-38	-49	38	-4	-20	-16	-17	-13	-13	-2	-4	-1	13	11	7
Nat. Inc.	1	-2	-7	6	-2	-6	-5	1	-3	-8	-4	4	1	2	-6	-2

Sources: Population Research Center, July 1st Annual Estimates 2000-2015. Oregon Health Authority, Center for Health Statistics. Calculated by Population Research Center (PRC).

Housing and Households

Over the entire 2000 to 2010 period, the total number of housing count decreased by about 17 units; this resulted in a reduction of two percent (Figure 13). Rufus and the area outside UGBs accounted for the largest loss in housing units, with Grass Valley also recording a slight loss. While the county as a whole saw a loss of housing units, Moro and Wasco recorded a combined increase of 25 housing units between 2000 and 2010.

With the exception of Moro, the direction of change in the number of total housing units in the county, UGBs, and area outside UGBs are similar to the direction of change in their corresponding populations. While the direction of change for housing may be similar to that of population, the growth rates for housing may differ from the rates for population because the numbers of total housing units are smaller than the numbers of persons, or the UGB has experienced changes in the average number of persons per household or in occupancy rates.

Figure 13. Sherman County and Sub-Areas—Total Housing Units (2000 and 2010)

	2000	2010	AAGR (2000-2010)	Share of County 2000	Share of County 2010
Sherman County	*935*	*918*	*-0.2%*	*100.0%*	*100.0%*
Grass Valley	93	92	-0.1%	9.9%	10.0%
Moro	150	163	0.8%	16.0%	17.8%
Rufus	162	141	-1.4%	17.3%	15.4%
Wasco	196	208	0.6%	21.0%	22.7%
Outside UGBs	334	314	-0.6%	35.7%	34.2%

Sources: U.S. Census Bureau, 2000 and 2010 Censuses.

Note 1: For simplicity each UGB is referred to by its primary city's name.

Occupancy rates tend to fluctuate more than PPH. This is particularly true in smaller UGB areas where fewer housing units cause larger changes—in relative terms. From 2000 to 2010 the occupancy rate in Sherman County declined slightly; this was most likely due to slack in demand for housing as individuals experienced the effects of the Great Recession. With the exception of Moro and Wasco, all of the sub-areas posted slight declines in the occupancy rate. Moro and Wasco both recorded increases in occupancy rates of more than one percentage point.

Average household size, or PPH, in Sherman County was 2.3 in 2010, only slightly lower than in 2000 (Figure 14). Sherman County's PPH in 2010 was slightly lower than for Oregon as a whole, which had a PPH of 2.5. PPH was very similar across the five sub-areas, with all of them being between 2.2 and 2.4 persons per household in 2010.

Figure 14. Sherman County and Sub-Areas—Persons per Household (PPH) and Occupancy Rate

	Persons Per Household (PPH)			Occupancy Rate		
	2000	2010	Change 2000-2010	2000	2010	Change 2000-2010
Sherman County	*2.4*	*2.3*	*-0.2*	*85.2%*	*84.6%*	*-0.6%*
Grass Valley	2.3	2.2	-0.1	80.6%	80.4%	-0.2%
Moro	2.5	2.2	-0.4	88.7%	91.4%	2.7%
Rufus	2.0	2.2	0.2	82.1%	81.6%	-0.5%
Wasco	2.3	2.3	0.0	85.7%	87.5%	1.8%
Outside UGBs	2.7	2.4	-0.3	86.2%	81.8%	-4.4%

Sources: U.S. Census Bureau, 2000 and 2010 Censuses.

Note 1: For simplicity each UGB is referred to by its primary city's name.

Assumptions for Future Population Change

Evaluating past demographic trends provides clues about what the future will look like, and helps determine the most likely scenarios for population change. Past trends also explain the dynamics of population growth specific to local areas. Relating recent and historical population change to events that influence population change serves as a gauge for what might realistically occur in a given area over the long-term.

Assumptions about fertility, mortality, and migration were developed for Sherman County's population forecast.[3] The assumptions are derived from observations based on life events, as well as trends unique to Sherman County. Population change for its sub-areas are determined by the change in the number or growth rate of total housing units and PPH. Assumptions around housing unit growth as well as occupancy rates are derived from observations of historical building patterns and any current plans for future housing development. In addition assumptions for PPH are based on observed historical patterns of household demographics—for example the average age of householder. The forecast period is 2016-2066.

Assumptions for the County

During the forecast period, the population in Sherman County is expected to age more quickly during the earlier years of the forecast period and then remain relatively stable over the forecast horizon. Fertility rates are expected to remain stable throughout the forecast period. Total fertility in Sherman County is forecast to stay at about two children per woman over the entire forecast period.

Changes in mortality and life expectancy are more stable and predictable compared to fertility and migration. One influential factor affecting mortality and life expectancy is the advancement in medical technology and health care. The county is projected to follow the statewide trend of increasing life expectancy throughout the forecast period—progressing from a life expectancy of 83 years in 2010 to 92 in 2060. However, in spite of increasing life expectancy and the corresponding increase in survival rates, Sherman County's aging population and large population cohort reaching a later stage of life will increase the overall number of deaths throughout the forecast period.

Migration is the most volatile and challenging demographic component to forecast due to the many factors influencing migration patterns. Economic, social, and environmental factors—such as employment, educational opportunities, housing availability, family ties, cultural affinity, climate change, and natural amenities—occurring both inside and outside the study area can affect both the direction and the volume of migration. Net migration rates are expected to change in line with historical trends unique to Sherman County. Net out-migration of younger adults and net in-migration of middle-age individuals will persist throughout the forecast period. Countywide average annual net migration is expected to increase from a net of three in-migrants in 2015 to 11 net in-migrants in 2035. Over the last

[3] County sub-areas with populations greater than 7,000 in the forecast launch year were forecast using the *cohort-component method*. County sub-areas with populations less than 7,000 in forecast launch year were forecast using the *housing-unit method*. See Glossary of Key Terms at the end of this report for a brief description of these methods or refer to the *Methods* document for a more detailed description of these forecasting techniques.

31 years of the forecast period average, annual net migration is expected to be steadier, increasing slightly to 14 net in-migrants by 2065. Net in-migration is expected to account for all of Sherman County's population growth throughout the first 14 years of the forecast period, but will not fully offset the growing natural decrease over the rest years of the forecast.

Assumptions for Sub-Areas

Rates of population growth for the smaller UGBs are assumed to be determined by corresponding growth in the number or growth rate of housing units, as well as changes in housing occupancy rates and PPH. The change in housing unit growth is much more variable than change in housing occupancy rates or PPH.

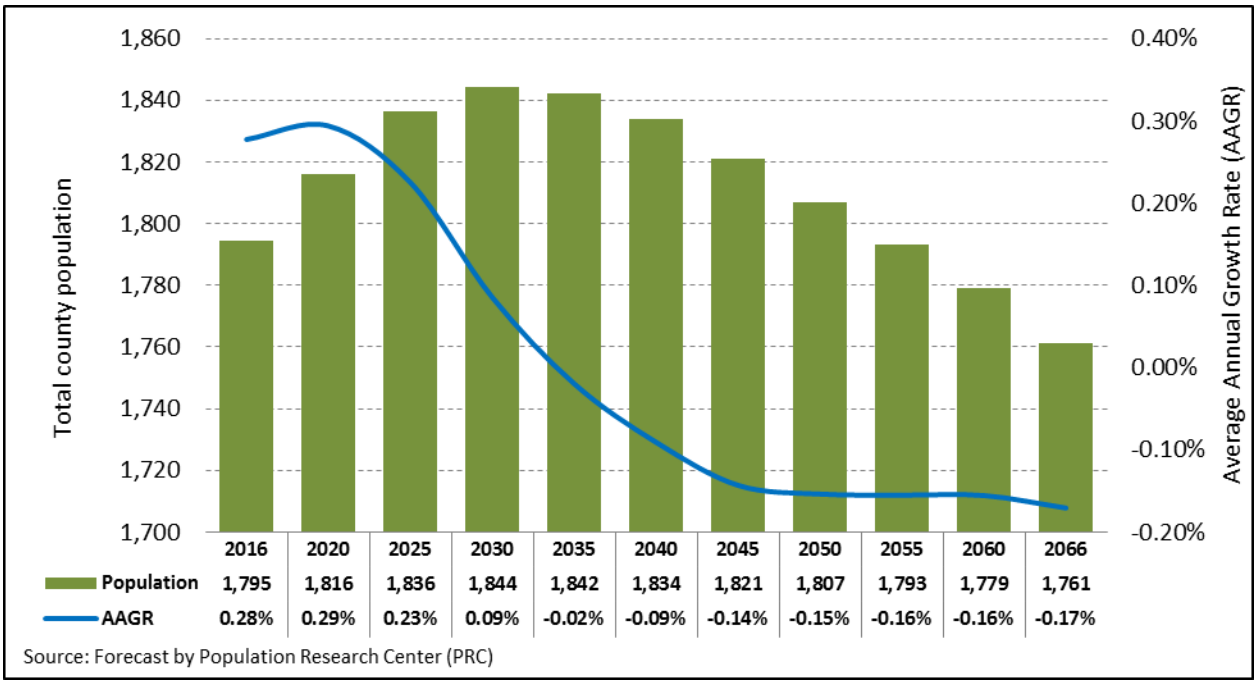
Occupancy rates and PPH are assumed to follow historical trends over the forecast period. For sub-areas experiencing population growth, we assume a higher growth rate in the near-term, with growth stabilizing over the remainder of the forecast period. If planned housing units were reported in the surveys, then they are assumed to be constructed over the next 5-15 years. Finally, for county sub-areas where population growth has been flat or has declined, and there is no planned housing construction, population growth is held mostly stable with little to no change.

Forecast Trends

Under the most-likely population growth scenario in Sherman County, countywide population is expected to slightly increase between 2016 and 2030 and then gradually decrease over the remainder of the forecast period. The countywide population growth rate is forecast to peak in 2020 and then decline throughout the forecast period. Forecasting tapered population growth is driven by both an aging population—contributing to a steady increase in deaths over the entire forecast period—as well as the expectation of relatively stable in-migration and a growing natural decrease over most of the forecast period. The combination of these factors will likely result in a declining, and eventually negative, population growth rate as time progresses through the forecast period.

Sherman County's total population is forecast to decline by about 30 persons (two percent) from 2016 to 2066, which translates into a total countywide population of 1,761 in 2066 (Figure 15). However in the near-term (2016-2030) the population is forecast to increase by nearly 50 persons. This anticipated population growth in the near-term is based on the assumption that more persons will move into the county than move out or die. The largest component of growth in this initial period is net in-migration.

Figure 15. Sherman County—Total Forecast Population (2016-2066)



Sherman County's two largest UGBs—Wasco and Rufus—are forecast to experience a combined population growth of more than 50 from 2016 to 2035, but between 2035 to 2066 Wasco is the only sub-area that is forecast to see a population increase (Figure 16). Moro and the area outside UGBs are both forecast to experience the largest declines in population, losing a total of more than 30 and 60 persons respectively over the forecast period. Moro and the area outside UGBs are also expected to decrease as a share of countywide population, while the remaining sub-areas are forecast to increase as a share of county population.

Figure 16. Sherman County and Sub-Areas—Forecast Population and AAGR

	2016	2035	2066	AAGR (2016-2035)	AAGR (2035-2066)	Share of County 2016	Share of County 2035	Share of County 2066
Sherman County	*1,795*	*1,842*	*1,761*	*0.1%*	*-0.1%*	*100.0%*	*100.0%*	*100.0%*
Grass Valley	164	163	163	0.0%	0.0%	9.1%	8.9%	9.3%
Moro	324	316	293	-0.1%	-0.2%	18.0%	17.1%	16.6%
Rufus	281	320	316	0.7%	0.0%	15.6%	17.4%	17.9%
Wasco	422	437	451	0.2%	0.1%	23.5%	23.7%	25.6%
Outside UGBs	604	605	539	0.0%	-0.4%	33.7%	32.9%	30.6%

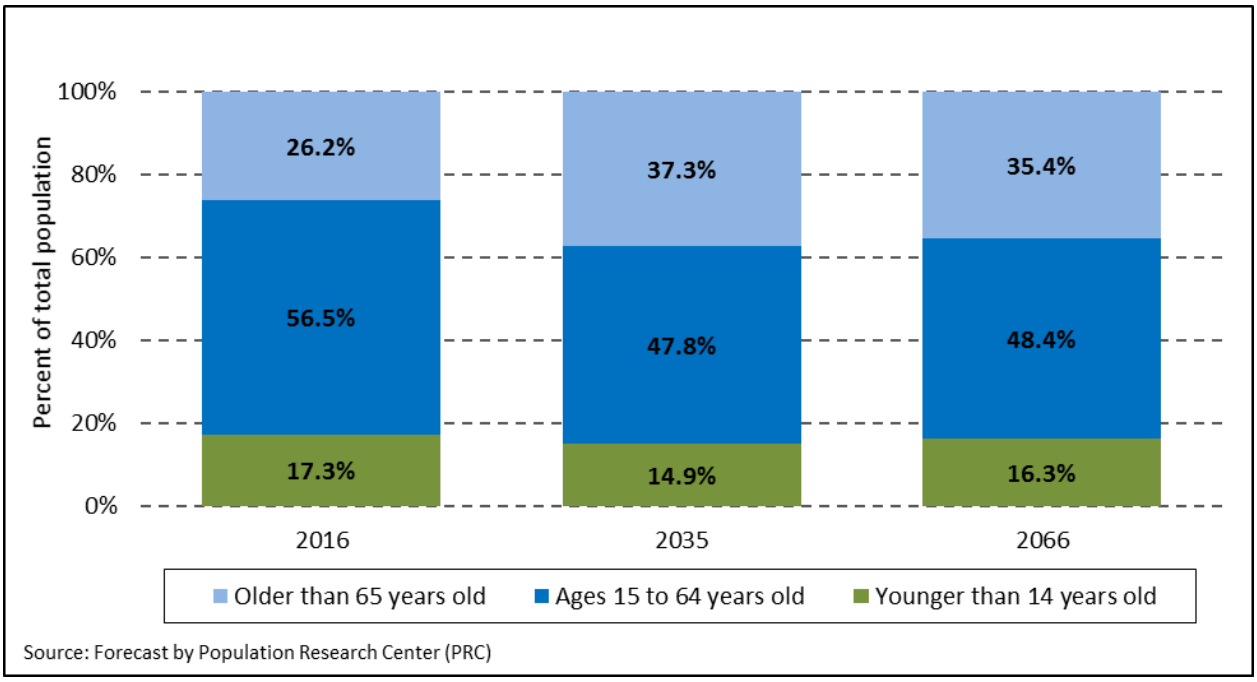
Source: Forecast by Population Research Center (PRC)

Note 1: For simplicity each UGB is referred to by its primary city's name.

Forecast Trends in Components of Population Change

As previously discussed, a key factor in increasing deaths is an aging population. From 2016 to 2035 the proportion of county population 65 or older is forecast to grow from roughly 26 percent to about 37 percent; however the proportion of the population 65 or older is expected to actually slightly decrease from 2035 to 2066 (Figure 17). For a more detailed look at the age structure of Sherman County's population see the forecast table published to the forecast program website (http://www.pdx.edu/prc/opfp).

Figure 17. Sherman County—Age Structure of the Population (2016, 2035, and 2066)

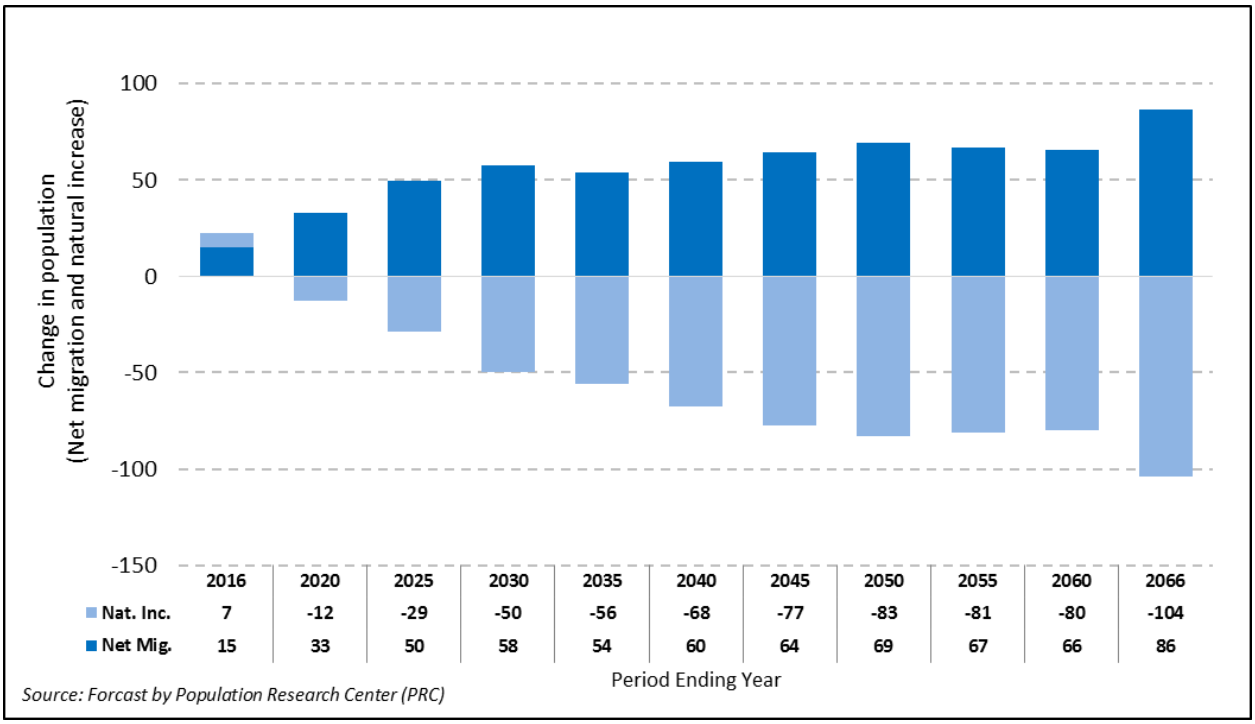


As the countywide population ages in the near-term—contributing to a slow-growing population of women in their years of peak fertility—and more women choose to have fewer children and have them at an older age, the number of average annual births is expected to decline; this combined with the rise in number of deaths, is expected to cause a natural decrease to grow in magnitude (Figure 18).

Net in-migration is forecast to increase rapidly in the near-term and then remain relatively stable over the remainder of the forecast period. The majority of these net in-migrants are expected to be middle-aged individuals and children under the age of 14.

In summary, growth in the magnitude of natural decrease and relatively steady net in-migration are expected to lead to a population increase reaching its peak in 2030 (Figure 18). Population decline is expected for the remainder of the forecast period (2035-2066). An aging population is expected to not only lead to an increase in deaths, but a smaller proportion of women in their childbearing years will likely result in a slight decline of the number of births. Net migration is expected to remain relatively steady throughout the forecast period, and is not expected to offset the more rapid growth in natural decrease.

Figure 18. Sherman County—Components of Population Change, 2016-2066



Glossary of Key Terms

Cohort-Component Method: A method used to forecast future populations based on changes in births, deaths, and migration over time; this method models the population in age cohorts, which are survived into progressively older age groups over time and are subject to age-specific mortality, fertility and net migration rates to account for population change.

Coordinated population forecast: A population forecast prepared for the county along with population forecasts for its city urban growth boundary (UGB) areas and non-UGB area.

Housing unit: A house, apartment, mobile home or trailer, group of rooms, or single room that is occupied or is intended for residency.

Housing-Unit Method: A method used to forecast future populations based on changes in housing unit counts, vacancy rates, the average numbers of persons per household (PPH), and group quarters population counts.

Occupancy rate: The proportion of total housing units that is occupied by individuals or groups of persons.

Persons per household (PPH): The average household size (i.e. the average number of persons per occupied housing unit for a particular geographic area).

Replacement Level Fertility: The average number of children each woman needs to bear in order to replace the population (to replace each male and female) under current mortality conditions. This is commonly estimated to be 2.1 children per woman in the U.S.

Appendix A: Surveys and Supporting Information

Supporting information is based on planning documents and reports, and from submissions to PRC from city officials and staff, and other stakeholders. The information pertains to characteristics of each city area, and to changes thought to occur in the future. The cities of Grass Valley, Moro, Rufus, and Wasco did not submit survey responses.

Grass Valley—Sherman County—NO SURVEY RESPONSE						
Observations about Population Composition (e.g. about children, the elderly, racial ethnic groups)	**Observations about Housing (including vacancy rates)**	**Planned Housing Development/Est. Year Completion**	**Future Group Quarters Facilities**	**Future Employers**	**Infrastructure**	**Promotions (Promos) and Hindrances (Hinders) to Population and Housing Growth; Other notes**
						Promos: **Hinders:**

Grass Valley—Sherman County—NO SURVEY RESPONSE	
Highlights or summary of influences on or anticipation of population and housing growth from planning documents and studies	
Other information (e.g. planning documents, email correspondence, housing development survey)	

Moro—Sherman County—NO SURVEY RESPONSE						
Observations about Population Composition (e.g. about children, the elderly, racial ethnic groups)	**Observations about Housing (including vacancy rates)**	**Planned Housing Development/Est. Year Completion**	**Future Group Quarters Facilities**	**Future Employers**	**Infrastructure**	**Promotions (Promos) and Hindrances (Hinders) to Population and Housing Growth; Other notes**
						Promos: **Hinders:**
Highlights or summary of influences on or anticipation of population and housing growth from planning documents and studies						

Moro—Sherman County—NO SURVEY RESPONSE	
Other information (e.g. planning documents, email correspondence, housing development survey)	

Rufus—Sherman County—NO SURVEY RESPONSE						
Observations about Population Composition (e.g. about children, the elderly, racial ethnic groups)	**Observations about Housing (including vacancy rates)**	**Planned Housing Development/Est. Year Completion**	**Future Group Quarters Facilities**	**Future Employers**	**Infrastructure**	**Promotions (Promos) and Hindrances (Hinders) to Population and Housing Growth; Other notes**
						Promos: **Hinders:**
Highlights or summary of influences on or anticipation of population and housing growth from planning documents and studies						

Rufus—Sherman County—NO SURVEY RESPONSE	
Other information (e.g. planning documents, email correspondence, housing development survey)	

Wasco—Sherman County—NO SURVEY RESPONSE						
Observations about Population Composition (e.g. about children, the elderly, racial ethnic groups)	**Observations about Housing (including vacancy rates)**	**Planned Housing Development/Est. Year Completion**	**Future Group Quarters Facilities**	**Future Employers**	**Infrastructure**	**Promotions (Promos) and Hindrances (Hinders) to Population and Housing Growth; Other notes**
						Promos: **Hinders:**
Highlights or summary of influences on or anticipation of population and housing growth from planning documents and						

Wasco—Sherman County—NO SURVEY RESPONSE	
studies	
Other information (e.g. planning documents, email correspondence, housing development survey)	

Appendix B: Specific Assumptions

Grass Valley

The 5-year average annual housing unit growth rate is assumed to be steady at zero percent throughout the forecast period, which is consistent with the 2010-2015 trend. The occupancy rate is assumed to be fairly stable at 80.5 percent throughout the 50-year horizon, roughly the same rate as in the 2010 Census. PPH is assumed to stay steady at 2.22 over the forecast period, also the same level as in the recent Census. The group quarters population is assumed to remain at zero.

Moro

The 5-year average annual housing unit growth rate is assumed to slightly decrease throughout the forecast period, a trend that is consistent with the changes during the 2000s and the 2010-2015 period. The overall 50-year annual average housing unit growth rate is close to zero percent. The occupancy rate is assumed to be stable at 86 percent throughout the 50-year horizon. PPH is assumed to stay steady at 2.30 over the forecast period, the same level as in Census 2010. There is no group quarters population in Moro.

Rufus

The 5-year average annual housing unit growth rate is assumed to slightly decrease throughout the forecast period, a trend that is consistent with the trend in the 2000s. The overall 50-year annual average housing unit growth rate is about 0.2 percent. The occupancy rate is assumed to be fairly stable at 82.5 percent throughout the 50-year horizon, a higher rate than both 2000 and 2010 Census. PPH is assumed to be stable at 2.43 over the forecast period, a rate that is consistent with the 2010-2015 level. The group quarters population is assumed to remain at zero.

Wasco

The 5-year average annual housing unit growth rate is assumed to slightly decline throughout the forecast period, which is consistent with the post-2000 trend, and the overall 50-year annual average is 0.1 percent. The occupancy rate is assumed to slightly increase, a trend that is consistent with the trend in the 2000s and 2010-2015 period, and averages 89 percent throughout the 50-year horizon. PPH is assumed to stay stable at 2.30 over the forecast period. There is no group quarters population in Wasco UGB.

Outside UGBs

The 5-year average annual housing unit growth rate is assumed to slightly increase throughout the forecast period, which is consistent to the trend after Census 2000; and the overall 50-year annual average is close to zero percent. The occupancy rate is assumed to slightly fluctuate, and averages 80 percent throughout the 50-year horizon. PPH is assumed to remain stable at 2.39 over the forecast period, which is roughly the same as the Census 2010 level. There is no group quarters population in this area.

Appendix C: Detailed Population Forecast Results

Figure 19. Sherman County - Population by Five-Year Age Group

Population Forecasts by Age Group / Year	2016	2020	2025	2030	2035	2040	2045	2050	2055	2060	2065	2066
00-04	96	88	81	78	80	83	85	87	84	81	82	83
05-09	113	113	104	96	93	96	101	105	103	98	98	98
10-14	102	116	117	109	102	99	104	111	110	106	105	106
15-19	92	91	108	111	104	97	96	103	105	102	103	103
20-24	60	58	58	71	74	69	66	66	67	68	69	69
25-29	59	46	45	46	57	60	57	55	53	53	55	57
30-34	95	72	54	54	56	69	73	71	66	62	64	65
35-39	111	121	87	66	66	69	86	93	86	78	76	77
40-44	88	106	121	88	67	68	71	91	94	85	81	80
45-49	84	90	115	132	97	75	76	82	99	100	95	94
50-54	136	87	95	123	142	106	82	86	87	105	110	108
55-59	157	143	83	92	121	140	105	84	84	84	104	105
60-64	132	163	146	86	97	127	150	115	87	86	89	94
65-69	143	132	172	158	94	105	140	168	124	92	94	95
70-74	112	137	129	167	159	94	107	146	166	122	94	95
75-79	100	112	145	139	180	175	104	122	158	176	135	128
80-84	62	79	94	122	121	152	155	95	104	131	150	143
85+	53	63	82	105	134	150	162	127	117	151	159	162
Total	**1,795**	**1,816**	**1,836**	**1,844**	**1,842**	**1,834**	**1,821**	**1,807**	**1,793**	**1,779**	**1,764**	**1,761**

Population Forecasts prepared by: Population Research Center, Portland State University, June 30, 2016.

Figure 20. Sherman County's Sub-Areas - Total Population

Area/Year	2016	2020	2025	2030	2035	2040	2045	2050	2055	2060	2065	2066
Sherman County	1,795	1,816	1,836	1,844	1,842	1,834	1,821	1,807	1,793	1,779	1,764	1,761
Grass Valley UGB	164	164	164	164	163	163	163	163	163	163	163	163
Moro UGB	324	323	321	319	316	313	309	305	302	298	294	293
Rufus UGB	281	297	311	318	320	320	320	319	318	317	316	316
Wasco UGB	422	427	432	435	437	440	442	444	446	448	450	451
Outside UGB Area	604	604	608	610	605	598	587	576	564	553	541	539

Population Forecasts prepared by: Population Research Center, Portland State University, June 30, 2016.